



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,068	07/14/2006	James William Griffith Turner	BWT-74734	3262
24201	7590	02/26/2008		
FULWIDER PATTON LLP HOWARD HUGHES CENTER 6060 CENTER DRIVE, TENTH FLOOR LOS ANGELES, CA 90045			EXAMINER TRIEU, THAI BA	
			ART UNIT 3748	PAPER NUMBER
			MAIL DATE 02/26/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/586,068

Applicant(s)

TURNER, JAMES WILLIAM
GRIFFITH

Examiner

Thai-Ba Trieu

Art Unit

3748

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 8-11, 15, 16, 29 and 30 is/are pending in the application.
- 4a) Of the above claim(s) 13, 14, 27 and 28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 8-11, 15, 16, 29 and 30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 11/02/2006
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

This Office Action is in response to the Election filed on January 18, 2008.

Applicant's election without traverse of the Species of Figure 2 and claims 1-4, 8-11, 13-16, and 26-30 being readable on this Species for prosecution, in the reply filed on January 18, 2008 is acknowledged.

Claims 5-7, 12, and 17-25 were cancelled.

Claims 13 and 27 are specifically readable on the non-elected species of Figure 5; therefore, claims 13 and 27 are not examined on the merits.

Claims 14 and 28 are specifically readable on the non-elected species of Figure 6; therefore, claims 14 and 28 are not examined on the merits.

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the ***"fuel delivery means", "actuator means", electronic controller"*** (See Claim 1) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet,

Art Unit: 3748

and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities: the following headings in the specification are missing: Background of the Invention, Summary of the Invention, Brief Description of The Drawings, Detailed Description of The Preferred Embodiment. Applicant is requested to insert heading to separate the various parts application. Appropriate correction is required.

Claim Objections

Claims 2-4, 9-11, 13-16, and 26-30 are objected to because of the following informalities:

- Line 1, "**A**" before "turbocharged internal combustion engine" should be replaced by -- **The** --.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 and its dependent claims 2-4 and 15-16; claim 8 and its dependent claims 9-11, 26, and 29-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically,

1. In claim 1, line 23; and claim 8, lines 22, 33, and 35, the recitation of "what proportion of the exhaust gas" renders the claim indefinite, since it is not clear that which proportion of the exhaust gas the applicant wants to reference to? Applicant is required to identify the proportion of the exhaust gas or to revise the claimed limitation.

2. In claim 1, line 27, the recitation of "can receive compressed air" renders the claim indefinite, since it is not clear that under which condition of the engine, the first turbocharger can receive the compressed air, and under which condition of the engine, the first turbocharger cannot receive the compressed air? Applicant is required to identify these conditions or to revise the claimed limitation.

3. In claim 4, line 3, the recitation of "can flow to the intake valve means" renders the claim indefinite, since it is not clear that under which condition of the

engine, air compressed by the second turbocharger can flow to the intake valve means, and under which condition of the engine, air compressed by the second turbocharger cannot flow to the intake valve means? Applicant is required to identify these conditions or to revise the claimed limitation.

4. In claim 8, the recitation of "the first exhaust duct relaying exhaust gas to the first high pressure turbocharger to drive the high pressure turbocharger to rotate and the second exhaust duct relaying exhaust gas to the second lower pressure turbocharger, bypassing the first high pressure turbocharger" renders the claim indefinite, since it is not clear that under which condition of the engine operation when the first exhaust duct relays exhaust gas to the first high pressure turbocharger to drive the high pressure turbocharger to rotate and the second exhaust duct relays exhaust gas to the second lower pressure turbocharger, the exhaust gas will bypass the first high pressure turbocharger? Applicant is required to identify the condition in order that the exhaust gas will bypass the first high pressure turbocharger to drive the second turbocharger to rotate.

5. In claim 10, line 3, the recitation of "can bypass" renders the claim indefinite, since it is not clear that under which condition of the engine, air can bypass the first high pressure turbocharger, and under which condition of the engine, air cannot bypass the first high pressure turbocharger? Applicant is required to identify these conditions or to revise the claimed limitation.

6. In claim 15, line 2, the recitations of "can inject fuel into the combustion chamber early enough in an upstroke" and "can alternatively inject fuel later in the upstroke" render the claim indefinite, since it is not clear that under which condition of the engine, the injectors can inject the fuel into the combustion engine, and under which condition of the engine, the injectors cannot inject the fuel into the combustion engine?

How early is to be considered as enough early in an upstroke in order that injectors inject fuel into the combustion chamber?

Then, under which condition of the engine, the injectors can alternatively inject fuel later in the upstroke, and under which condition of the engine, the injectors cannot alternatively inject fuel later in the upstroke?

Applicant is required to identify these conditions or to revise the claimed limitation.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 8-9, 15, 26 and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Takeshi Yamane (Patent Number JP 61-164039 A), in view of Yasuyuki Santo (Patent Number JP 01-285619 A).

Regarding claims 1, 3 and 15, Takeshi Yamane discloses a turbocharged internal combustion engine (1) comprising:

a variable volume combustion chamber (2);

inlet valve means (20, 21) controlling flow of air into the combustion chamber (2);

fuel delivery means (Not Shown, Well-known components of the internal combustion engines) for delivering fuel into the air to be mixed therewith;

exhaust valve means (22, 23) for controlling flow of combusted gases from the combustion chamber (2);

compressor means (5B, 6B) for compressing the air prior to admission of the air into the combustion chamber (2);

actuator means (Not Shown, Well-known components of the internal combustion engines) for opening and closing the exhaust valve means (22, 23); and

an electronic controller (Not Shown, Well-known components of the internal combustion engines) which controls operation of the actuator means (Not Shown, Well-known components of the internal combustion engines) to thereby control opening and closing of the exhaust valve means (22, 23), wherein:

the exhaust valve means (22, 23) comprises at least a first exhaust valve (22) connected to a first exhaust duct (24) and at least a second exhaust valve (23) connected to a second exhaust duct (25) separate and independent from the first exhaust duct (24);

the compressor means (5B, 6B) comprises a first turbocharger (5A) and the first exhaust duct (24) is connected to the first turbocharger (5A) so that

Art Unit: 3748

exhaust gases passing through the first exhaust duct (24) drive the first turbocharger (5A) to rotate;

the second exhaust duct (25) bypasses the first turbocharger (5, 5A) and the combusted gases flowing through the second exhaust duct (25) are exhausted without passing through the first turbocharger (5, 5A); and

the electronic controller (Not Shown, Well-known components of the internal combustion engines) by controlling operation of the actuator means (Not Shown, Well-known components of the internal combustion engines) and thereby the opening and closing of the first and second exhaust valves (22, 23) is operable to control what proportion of the combusted gases leaving the combustion chamber (2) flow through each of the first and second exhaust ducts (24, 25);

the compressor means (5B, 6B) comprises additionally a second turbocharger (6, 6B, 6A);

the first turbocharger (5, 5B, 5A) is a high pressure turbocharger which can receive compressed air at a first pressure from the second turbocharger (6, 6B, 6A), which is a low pressure turbocharger, and the first turbocharger (5B) compresses the air to a second higher pressure; and

combusted gases leaving the first turbocharger (5, 5B, 5A) after expansion in a turbine (5A) thereof are combined with the combusted gases flowing in the second exhaust duct (25) and then the combined flow of combusted gases drive the second turbocharger (6, 6B, 6A) to rotate; and

Art Unit: 3748

a first intercooler (10) through which air compressed in the second low pressure turbocharger (6, 6B, 6A) passes before reaching the first high pressure turbocharger (5, 5B, 5A) (See Figure 1-2 and 4, and Abstract);

wherein the injector means (Not Shown, Well-known components of the internal combustion engines) can inject fuel into the combustion chamber (2) early enough in an upstroke for mixing of the fuel with air to produce a homogeneous mixture which is then ignited by homogenous charge compression ignition and wherein the injection means (Not Shown, Well-known components of the internal combustion engines) can alternatively inject fuel later in the upstroke for compression ignition in the combustion chamber.

Note that the recitation of "wherein the injector means can inject fuel into the combustion chamber early enough in an upstroke for mixing of the fuel with air to produce a homogeneous mixture which is then ignited by homogenous charge compression ignition and wherein the injection means can alternatively inject fuel later in the upstroke for compression ignition in the combustion chamber" is considered as the functional language. Takashi Yamane discloses all the structural components of an engine system, which are read on those of the instant invention. Therefore, the Takashi Yamane system is capable of performing the same desired functions as the instant invention having been claimed in claim 15.

Additionally, when a claim includes a 'whereby' clause or similar clause, it must contain, in order to be complete, an enumeration of sufficient elements to perform the

function so specified in such clause. A "whereby" clause is not objectionable. It merely states the result and adds nothing to the patentability of a claim (Israel v. Cresswell, 76 USPQ 594; In re Boileau, 1948 C. D. 83).

Regarding claims 8-9, 26, and 29, Takeshi Yamane discloses a turbocharged internal combustion engine comprising:

a variable volume combustion chamber (2);

inlet valve means (20, 21) controlling flow of air into the combustion chamber (2);

fuel delivery means (Not Shown, Well-known components of the internal combustion engines) for delivering fuel into the air to be mixed therewith;
exhaust valve means for controlling flow of combusted gases from the combustion chamber;

compressor means (5B, 6B) for compressing the air prior to admission of the air into the combustion chamber (2);

actuator means (Not Shown, Well-known components of the internal combustion engines) for opening and closing the exhaust valve means (22, 23);
and

an electronic controller (Not Shown, Well-known components of the internal combustion engines) which controls operation of the actuator means (Not Shown, Well-known components of the internal combustion engines) to thereby control opening and closing of the exhaust valve means (22, 23), wherein:

the exhaust valve means (22, 23) comprises at least a first exhaust valve (22) connected to a first exhaust duct (24) and at least a second exhaust valve (23) connected to a second exhaust duct (25) separate and independent from the first exhaust duct (24);

the compressor means (5B, 6B) comprises a first turbocharger (5, 5B, 5A) and the first exhaust duct (24) is connected to the first turbocharger (5, 5B, 5A) so that exhaust gases passing through the first exhaust duct (24) drive the first turbocharger (5, 5B, 5A) to rotate;

the second exhaust duct (25) bypasses the first turbocharger (5, 5B, 5A) and the combusted gases flowing through the second exhaust duct (25) are exhausted without passing through the first turbocharger (5, 5B, 5A);

the electronic controller (Not Shown, Well-known components of the internal combustion engines) by controlling operation of the actuator means (Not Shown, Well-known components of the internal combustion engines) and thereby the opening and closing of the first and second exhaust valves (22, 23) is operable to control what proportion of the combusted gases leaving the combustion chamber flow through each of the first and second exhaust ducts (24, 25);

(the compressor means 5B, 6B) comprises a second low pressure turbocharger (6, 6B, 6A) which compresses air to a first pressure and the first turbocharger (5, 5B, 5A) is a high pressure turbocharger which compresses air

compressed by the low pressure turbocharger (6, 6B, 6A) to a second pressure higher than the first pressure;

the first exhaust duct (24) relays exhaust gas to the first high pressure turbocharger (5, 5B, 5A) to drive the high pressure turbocharger to rotate and the second exhaust duct (25) relays exhaust gas to the second lower pressure turbocharger (6, 6B, 6A), bypassing (via 7) the first high pressure turbocharger, to drive the second low pressure turbocharger to rotate; and

the controller (Not Shown, Well-known components of the internal combustion engines) controls operation of the actuator means (Not Shown, Well-known components of the internal combustion engines) to control what proportion of combusted gases flowing from the combustion chamber flow through the first exhaust duct (24) and what proportion flow through the second exhaust duct (25), the controller thereby controlling operation of the first high pressure and the second low pressure turbochargers (5, 5B, 5A; 6, 6B, 6A);

wherein the expanded exhaust gases leaving the first high pressure turbocharger (5, 5B, 5A) are fed into the second exhaust duct (25) to be relayed to the second low pressure turbocharger (6, 6B, 6A) (See Figures 1-2 and 4, and Abstract);

wherein the compressor means comprises additionally an intercooler (10) for cooling the compressor intake air prior to delivery of the air into the combustion chamber (2) (See Figures 1-2 and 4);

wherein the injector means (Not Shown, Well-known components of the internal combustion engines) can inject fuel into the combustion chamber (2) early enough in an upstroke for mixing of the fuel with air to produce a homogeneous mixture which is then ignited by homogenous charge compression ignition and wherein the injection means (Not Shown, Well-known components of the internal combustion engines) can alternatively inject fuel later in the upstroke for compression ignition in the combustion chamber.

Note that the recitation of "wherein the injector means can inject fuel into the combustion chamber early enough in an upstroke for mixing of the fuel with air to produce a homogeneous mixture which is then ignited by homogenous charge compression ignition and wherein the injection means can alternatively inject fuel later in the upstroke for compression ignition in the combustion chamber" is considered as the functional language. Takashi Yamane discloses all the structural components of an engine system, which are read on those of the instant invention. Therefore, the Takashi Yamane system is capable of performing the same desired functions as the instant invention having been claimed in claim 29.

Additionally, when a claim includes a 'whereby' clause or similar clause, it must contain, in order to be complete, an enumeration of sufficient elements to perform the function so specified in such clause. A 'whereby' clause is not objectionable. It merely states the result and adds nothing to the patentability of a claim (Israel v. Cresswell, 76 USPQ 594; In re Boileau, 1948 C. D. 83).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshi Yamane (Patent Number JP 61-164039 A), in view of Yasuyuki Santo (Patent Number JP 01-285619 A).

Takeshi Yamane discloses the invention as recited above; however, Takeshi Yamane fails to disclose a catalytic converter and its location.

Yasuyuki Santo teaches that it is conventional in the supercharged internal combustion engine art, to utilize a catalytic converter (15) receiving combusted gases leaving the second turbocharger then to atmosphere (See Figure 1).

It would have been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized a catalytic converter and its location, to reduce exhaust emissions for the Takeshi Yamane device.

Claims 4 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshi Yamane (Patent Number JP 61-164039 A), in view of Yuji Hirabayashi (Patent Number JP 61-277818 A).

Takeshi Yamane discloses the invention as recited above; however, Takeshi Yamane fails to disclose an intake air bypass passage and a bypass valve.

Hirabayashi teaches that it is conventional in the art of multistage type turbo-supercharged internal combustion engines, to utilize an intake air bypass passage (from 5 to 18) through which air compressed by the second turbocharger (3) can flow to the intake valve means bypassing the first turbocharger (2) and bypass valve means (7) controlling flow of the compressed air through the bypass passage (5 to 18) (See Figures 1-2, Abstract)

It would have been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized an intake air bypass passage, as taught by Hirabayashi, to improve the efficiency of the Takeshi Yamane device, since the use thereof would have controlled the compressed intake air to be delivered into the engine based on the operating condition of the engine.

Claims 16 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshi Yamane (Patent Number JP 61-164039 A), in view of either Lovell (Patent Number 3,202,141) or Gray (Patent Number 6,550,430 B2).

Takeshi Yamane discloses the invention as recited above; however, Takeshi Yamane fails to disclose the controller closing the exhaust valve means to trap combusted gases forming a mixture with the fuel and air and serving to delay ignition of the fuel and air mixture when the engine is operating with homogenous charge compression ignition.

Lovell/Gray teaches that it is conventional in the art of operating compression ignition engine, to utilize in part loading operating conditions of the engine, the controller operating to close the exhaust valve means during the upstroke of the piston in order to trap combusted gases in the combustion chamber, the trapped combusted gases forming a mixture with the fuel and air and serving to delay ignition of the fuel and air mixture when the engine is operating with homogenous charge compression ignition (Column 3, lines 27-54, Column 7, lines 74-75, and Column 8, lines 1-8 of Lovell; Column 2, lines 25-45, Column 3, lines 62-67, Column 4, lines 1-21, Column 6, lines 59-67, Column 7, lines 1-4 and 27-42, Column 13, lines 25-67, Column 14, lines 36-53, Column 15, lines 4-10 and 32-51 of Gray).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized the controller closing the exhaust valve means to trap combusted gases forming a mixture with the fuel and air and serving to delay ignition of the fuel and air mixture when the engine is operating with homogenous charge compression ignition, to improve the efficiency of Takeshi Yamane device, since the use thereof would have controlled the desired air-fuel ratio for operating the engines.

Prior Art

The IDS (PTO-1449) filed on November 02, 2006 has been considered. An initialized copy is attached hereto.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thai-Ba Trieu whose telephone number is (571) 272-4867. The examiner can normally be reached on Monday - Thursday (6:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic

Art Unit: 3748

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TTB
February 11, 2008



Thai-Ba Trieu
Primary Examiner
Art Unit 3748